

AMENDMENTS TO THE CLAIMS

Please amend claims 38 and 39 as follows:

1. – 37. (Canceled).

38. (Currently Amended) A computer system, comprising:

a local area network (LAN);

a plurality of computers without on-board user interface controllers, each of the plurality of computers being coupled to the LAN and being in communication with each other over the LAN, each of the plurality of computers comprising:

at least one central processing unit (CPU); and

a system controller being coupled to the at least one CPU and a LAN interface, the LAN interface being coupled to communicate over the LAN;

a console comprising a user input device and a user output device, said console being coupled to communicate over the LAN such that the console ~~conveys~~ encapsulates an input received via the user input device into incoming data frames, conveys the incoming data frames over the LAN to each of the plurality of computers, [[and]] de-encapsulates outgoing data frames received to receive an output generated by the console from each of the plurality of computers over the LAN into an output for display using the user output device; and

[[an]] a plurality of input/output (I/O) devices being device, coupled to the LAN, the plurality of I/O devices comprising the user input device and the user output device of the console, each of the plurality of computers being in communication with the plurality of I/O devices over the LAN,

wherein the plurality of computers and the console are arranged to communicate over the LAN by transmitting Layer 2 data frames,

wherein the plurality of computers and the console are arranged to convey the input and the output by tunneling over Layer 2 on the LAN,

wherein the plurality of computers and the console are arranged to encapsulate the input and output in Internet Protocol (IP) packets for transmission over the LAN,

wherein the plurality of computers and the console are arranged to encapsulate the input and output using an application-layer protocol,

wherein the plurality of computers are arranged to transmit the outgoing data frames ~~I/O commands~~ over the LAN to the plurality of I/O devices ~~device and comprise no on-board I/O device controllers,~~

wherein each of the plurality of computers further comprises a plurality of on-board I/O device controllers, consisting of:

at least one LAN interface being directly coupled to the LAN and connected to the system controller; and

an emulation processor, said emulation processor being directly coupled to the system controller, the emulation device comprising: to trap the I/O commands from the at least one CPU while emulating the I/O device, and to encapsulate the I/O commands in data frames for transmission over the LAN to the I/O device such that the I/O device is caused to fulfill the commands

I/O trap logic being directly coupled to the system controller, the I/O trap logic being configured to intercept and trap a plurality of outputs sent by the at least one CPU to the plurality of I/O devices, to pass a plurality of inputs received from a service processor of the emulation device to the at least one CPU via the system controller, and to emulate behavior of the plurality of I/O devices to the at least one CPU and the system controller; and

the service processor being directly coupled to the I/O trap logic, the service processor being configured to receive the intercepted and trapped plurality of outputs from the I/O trap logic, to encapsulate the received plurality of outputs into the outgoing data frames, to transmit the outgoing data frames via the at least one LAN interface through the LAN for delivery to the plurality of I/O devices, to receive the incoming data frames via the at least one LAN interface sent by the plurality of I/O devices through the LAN, to de-encapsulate the received incoming data frames into the plurality of inputs, and to convey the plurality of inputs to the I/O trap logic for emulation to the at least one CPU via the system controller,

wherein the emulation processor is arranged to encapsulate the ~~I/O commands~~ plurality of outputs in Ethernet frames,

wherein the emulation processor is arranged to encapsulate the ~~I/O commands~~ plurality of outputs in Internet Protocol (IP) packets, and

wherein the emulation processor is arranged to encapsulate the ~~I/O commands~~ plurality of outputs using an application-layer protocol.

39. (Currently Amended) A computer system, comprising:

a local area network (LAN);

a plurality of peripheral devices having I/O controllers, the peripheral devices being connected to the LAN;

a plurality of computers being coupled to the LAN and being in communication with each other and the plurality of peripheral devices over the LAN, each of the plurality of computers comprising:

at least one central processing unit (CPU);

a main memory;

a system controller, comprising:

an internal bus;

a memory controller that connects the main memory to the internal bus;

at least one CPU interface port that connects the at least one CPU with the internal bus; and

a plurality of peripheral interface ports connected to the internal bus;

a plurality of LAN interfaces, comprising:

a fast Ethernet interface that connects one of the plurality of peripheral interface ports of the system controller to the LAN; and

an emulation processor that connects an other one of the plurality of peripheral interface ports of the system controller to the LAN, the emulation processor comprising:

input/output (I/O) trap logic that connects to the system controller via the other one of the peripheral interface ports of the system controller, intercepts outputs sent from the at least one CPU to the plurality of peripheral devices, traps the intercepted outputs, emulates behavior of the I/O controllers of the plurality of peripheral devices such that the at least one CPU and the system controller are not aware that I/O functions are being performed remotely, receives de-encapsulated inputs, and passes the de-encapsulated inputs to the at least one CPU via the system controller;

a service processor that receives the trapped outputs from the I/O trap logic, encapsulates the trapped outputs in transmission control protocol/internet protocol (TCP/IP) packets for transmission to appropriate ones of the plurality of peripheral devices via the LAN, establishes TCP/IP connections with I/O controllers of the appropriate ones of the peripheral devices, receives encapsulated inputs in TCP/IP packets over TCP/IP connections sent from the plurality of peripheral devices via the LAN, de-encapsulates the encapsulated inputs, and conveys the de-encapsulated inputs to the I/O trap logic; and

an emulation Ethernet interface through which the service processor transmits the outputs to and receives the inputs from the LAN; and

a non-volatile memory that holds basic input/output system (BIOS) commands used by each of the plurality of computers during an initial stage of boot-up of each of the plurality of computers, the non-volatile memory being connected to the service processor and to the system controller via the emulation processor; and

a console for sending inputs to and receiving outputs from the computers via the LAN, the console comprising:

a keyboard and a mouse for sending inputs; and

a video display and an audio output for receiving outputs,

wherein the plurality of computers has no on-board user interface, and

wherein the plurality of peripheral devices comprises the console ~~local storage, no I/O interfaces, and no I/O controllers other than the LAN interfaces.~~